

Application No.: 09/980,910

Docket No.: NY-DNAG 224-US

IN THE CLAIMS

1-83 (canceled)

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84. (currently amended) A method comprising applying a phosphate coating to a metallic coil by wetting a surface of the metallic coil with an aqueous, acidic phosphating solution and drying the phosphating solution on the coated surface of the coil to form a crystalline-coating on said metallic coil, wherein the phosphating solution comprises 26 to 60 g/l of zinc ions; at least 5 to 40 g/l of manganese ions; and 50 to 300 g/l of phosphate ions, calculated as P_2O_5 , and ~~25~~ from 10 to 120 g/l of peroxide calculated as H_2O_2 , wherein to form a coating having a coating weight in the range of from 0.2 to 5 g/m² ~~a layer having a layer weight for the precipitated and dried phosphate layer in the range from 0.3 to 4 g/m² is formed with the phosphating solution.~~

85. (currently amended) A method comprising applying a phosphate coating to a metallic coil by wetting a surface coil metallic with an aqueous, acidic phosphating solution and drying of the phosphating solution to form a crystalline coating on the surface of the coil, wherein the phosphating solution comprises 10 to 60 g/l of zinc ions; 0.5 to 40 g/l of manganese ions; 50 to 300 g/l of phosphate ions, calculated as P_2O_5 ; and one ~~25~~ of 10 to 120 g/l of peroxide ions, calculated as H_2O_2 or 0.5 to 50 g/l of at least one of a polymer, a copolymer or a cross polymer, wherein to form a coating having a coating weight of from 0.2 to 5 g/m² ~~a layer having a layer weight for the precipitated and dried phosphate layer in the range from 0.3 to 4 g/m² is formed with the phosphating solution.~~

86. (previously presented) A method according to claim 84, wherein the phosphating solution is free or substantially free of nickel or contains up to 20 g/l of nickel ions.

Application No.: 09/980,910

Docket No.: NY-DNAG 224-US

87. (previously presented) A method according to claim 84, wherein the phosphating solution contains polymers, copolymers and/or cross polymers, in particular of N-containing heterocyclic compounds, preferably of vinyl pyrrolidones.

88. (previously presented) A method according to claim 84, wherein a phosphating solution is used in which the ratio of the sum of cations to the phosphate ions, calculated as P_2O_5 , ranges from 1:1 to 1:8.

89. (previously presented) A method according to claim 84, wherein an amount of phosphating solution in the range from 1 to 12 ml/m² is applied to the metal parts for drying.

90. (previously presented) A method according to claim 84, wherein a layer weight for the precipitated and dried phosphate layer in the range from 0.3 to 3 g/m² is formed with the phosphating solution.

91. (previously presented) A method according to claim 84, wherein the phosphating solution is applied by spraying, by roller application, by flooding and sub sequent squeezing off, by splashing and subsequent squeezing off or by dipping and subsequent squeezing off.

92. (previously presented) A method according to claim 84, wherein the liquid film formed on the metal part with the phosphating solution is dried on the surface of the metal part at temperatures in the range from 20 to 120°C with respect to PMT temperatures.

93. (previously presented) A method according to claim 84, wherein a phosphate layer having the following composition is formed:

free or substantially free of nickel or up to a content of 10% by weight nickel;
5 to 40% by weight Zn,
at least 5 to 14% by weight Mn, and
20 to 70% by weight phosphate, calculated as P_2O_5 .

Application No.: 09/980,910

Docket No.: NY-DNAG 224-US

94. (previously presented) A method according to claim 84, wherein after drying the coated surface wetted with a second aqueous, acidic phosphating solution, this second solution being free or substantially free of nickel, or containing up to 20 g/l of nickel ions in the phosphating solution and 0 to 20 g/l of zinc ions, at least 5 g/l manganese ions, and 5 to 50 g/l of phosphate ions, calculated as P_2O_5 .
95. (previously presented) A method according to claim 84, wherein before wetting with the first and/or second phosphating solution, the metal parts are wetted with an activating solution or activating suspension.
96. (previously presented) A method according to claim 84, wherein the first phosphating solution contains at least 0.3 mg/l of copper ions, and the second phosphating solution which is optionally used contains 0.1 to 50 mg/l of copper ions.
97. (previously presented) A method according to claim 84, wherein at least one of the second phosphating solutions has an A-value, as ratio of the free acid to the total content of the phosphate ions, in the range from 0.03 to 0.6.
98. (previously presented) A method according to claim 84, wherein at least one of the second phosphating solutions contains at least one catalyst.
99. (previously presented) A method according to claim 84, wherein at least one of the first or second phosphating solutions contains a peroxide admixture.
100. (previously presented) A method according to claim 84, wherein at least one of the first or second phosphating solution has a content of at least one compound based on perboric acid, lactic acid, tartaric acid, citric acid and a chemically related hydroxy carboxylic acid.
101. (previously presented) A method according to claim 84, wherein at least one of the first or second phosphating solution contains at least one ion selected from the group consisting of

Application No.: 09/980,910

Docket No.: NY-DNAG 224-US

aluminum, boron, iron, hafnium, molybdenum, silicon, titanium, zirconium, fluoride, and complex fluoride, in free or bound form.

102. (previously presented) A method according to claim 84, wherein the first and/or second phosphating solution is applied at a temperature in the range from 10 to 80°C.

103. (previously presented) A method according to claim 84, wherein a passivating solution is applied directly to a phosphate layer.

104. (previously presented) A method according to claim 84, wherein the first and/or second phosphate layer which has died on to the metal part is wetted with an oil, a dispersion or a suspension, in particular a deforming oil or anticorrosive oil and/or a lubricant.

105. (previously presented) A method according to claim 84, wherein an oil coating or lubricant coating which is possibly present is removed from or out of the first or second phosphate layer respectively.

106. (previously presented) A method according to claim 84, wherein the metal parts which have been provided with a first and/or second phosphate layer are coated with a lacquer paint, with another type of organic coating and/or with a layer of adhesive, and possibly deformed, in which case the metal parts which have been coated in this way can additionally be glued, welded, and/or connected in another way to other metal parts.

107. (previously presented) A method according to claim 84, wherein the metal surface was first provided with at least a first phosphate layer either before or not until after the deformation and/or assembly.

108. (previously presented) The method of claim 84, wherein the dried phosphate layer ranges from 0.3 to 2 g/m².

109. (previously presented) A method according to claim 101, wherein at least one of the first or second phosphating solution has a content of 0.01 to 5 g/l of fluoride in free or bound form.

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Application No.: 09/980,910

Docket No.: NY-DNAG 224-US

110. (currently amended) A method comprising applying a phosphate coating to a metallic surface by wetting the surface with an aqueous, acidic phosphating solution and drying the phosphating solution on the coated surface to form a coating on said metallic surface, wherein the phosphating solution comprises 26 to 60 g/l of zinc ions; at least 5 to 40 g/l of manganese ions; and 50 to 300 g/l of phosphate ions, calculated as P_2O_5 , ~~wherein to form a coating having a coating weight of from 0.2 to 5 g/m² a layer having a layer weight for the precipitated and dried phosphate layer in the range from 0.3 to 4 g/m² is formed with the phosphating solution solution, wherein the ratio of cations to P_2O_5 is 1:1.2 to 1:7.~~

111. (currently amended) A method comprising applying a phosphate coating to a metallic surface by wetting the metallic surface with an aqueous, acidic phosphating solution and drying of the phosphating solution to form a coating on the metallic surface, wherein the phosphating solution comprises 10 to 60 g/l of zinc ions; at least 5 to 40 g/l of manganese ions; 50 to 300 g/l of phosphate ions, calculated as P_2O_5 ; and one of ~~25~~ 0.5 to 120 g/l of peroxide ions, calculated as H_2O_2 or 0.5 to 50 g/l of at least one of a polymer, a copolymer or a cross polymer, ~~wherein to form a coating having a coating weight of from 0.2 to 5 g/m² layer having a layer weight for the precipitated and dried phosphate layer in the range from 0.3 to 4 g/m² is formed with the phosphating solution, wherein the ratio of cations to P_2O_5 is 1:1.2 to 1:7.~~

112. (previously presented) The method of claim 111, wherein a layer having a layer weight for the precipitated and dried phosphate layer in the range from 0.3 to 3 g/m² is formed with the phosphating solution.

113. (previously presented) The method of claim 111, wherein the content of managanese ions ranges from 5 to 40 g/l.

114. (previously presented) The method of claim 84, wherein the content of managanese ions ranges from 5 to 40 g/l.

Application No.: 09/980,910

Docket No.: NY-DNAG 224-US

115. (currently amended) A method comprising applying a phosphate coating to a metallic surface by wetting the surface with an aqueous, acidic phosphating solution and drying the phosphating solution on the coated surface to form a coating on said metallic surface, wherein the phosphating solution comprises 26 to 60 g/l of zinc ions; at least 5 to 40 g/l of manganese ions; and 50 to 300 g/l of phosphate ions, calculated as P_2O_5 , wherein a coating having a coating weight of from 0.2 to 5 g/m² ~~layer having a layer weight for the precipitated and dried phosphate layer in the range from 0.3 to 4 g/m²~~ is formed with the phosphating solution, and contacting the resultant coated metallic surface with a second phosphating solution.

116. (currently amended) A method comprising applying a phosphate coating to a metallic surface by wetting the metallic surface with an aqueous, acidic phosphating solution and drying of the phosphating solution to form a coating on the metallic surface, wherein the phosphating solution comprises 10 to 60 g/l of zinc ions; at least 5 to 40 g/l of manganese ions; 50 to 300 g/l of phosphate ions, calculated as P_2O_5 ; and one of 25 ~~0.5~~ to 120 g/l of peroxide ions, calculated as H_2O_2 or 0.5 to 50 g/l of at least one of a polymer, a copolymer or a cross polymer, and contacting the resultant coated metallic surface with a second phosphating solution, wherein a coating having a coating weight of from 0.2 to 5 g/m² ~~layer having a layer weight for the precipitated and dried phosphate layer in the range from 0.3 to 4 g/m²~~ is formed with the phosphating solution.

117. (previously presented) A method according to claim 92, wherein said catalyst is selected from the group consisting of a peroxide, a nitroguinidine, a nitrobenzene sulphonic acid, a hydroxylamine, a chlorate, a nitrate a perborate, and an organic nitro compound.

118. (previously presented) A method according to claim 117, wherein said catalyst is p-nitrotoluene sulphonic acid.